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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,389

04/12/2007

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081551-000000US

8976

20350 7590 07/23/2010
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EXAMINER

PHILLIPS, FORREST M

ART UNIT

PAPER NUMBER

2832

MAIL DATE

DELIVERY MODE

07/23/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/574,389	Applicant(s) MIRLACH ET AL.	
	Examiner FORREST M. PHILLIPS	Art Unit 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE19743446 (to BMW hereinafter '446) in view of Worner (US6938729) and Cathcart (US6662900).

With respect to claim 1 '446 discloses an exhaust system for an internal combustion engine (see figure 1) comprising:

A first exhaust train starting from a first cylinder bank (associated with element 6 in figure 1) including a flow permeable first muffler (3) in particular a rear muffler and

At least one second exhaust train (associated with element 5) parallel thereto starting from a separate set of cylinders and including a flow permeable second muffler (2) in particular a rear muffler, wherein the first muffler and the second muffler have a mutually deviating structure (that is the mufflers flow through different paths and deviate from one another in terms of the flow and exits); and

wherein the first and second exhaust trains are guided over the whole length with at most one cross-over position (within element 4' in figure 3), the first muffler comprises an inlet pipe (6) and an outlet pipe (13) with the outlet pipe, and the second muffler (2) comprises an inlet pipe (5) and an outlet pipe (11) ;

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the outlet pipe of the first muffler has a comparatively small length with respect to the outlet pipe of the second muffler; and the outlet pipe of the second muffler has a comparatively large length with respect to the outlet pipe of the first muffler (see figure 3).

'446 does not disclose first and second cylinder banks, but rather is applied to an inline engine.

Worner discloses an exhaust system for a two cylinder banked engine (shown is a V-6, but is applicable to a V-8, V-10, V-12 or any other two cylinder banked engine system) having a cross over point (within element 8 in figure 1) and having two rear mufflers thereafter (3 and 4 in figure 1), which are divergent in position.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the internal characteristics of the mufflers of '446 with the V type engine and exhaust system as taught by Worner, to have the exhaust flow and sound gains applicable to any engine, inline or V type configuration.

'446 as modified does not disclose wherein the cross over is minimal.

Cathcart discloses an exhaust cross over, which being perpendicular to the flow of exhaust allows for only partial cross over of exhaust pulsations.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Cathcart to allow for partial cross over of exhaust pulses with the exhaust of '446 as modified to cancel low frequency exhaust sounds.

With respect to claim 2 while '446 does not disclose expressly that the outlet pipe of the second muffler has at least approximately twice the length of the outlet pipe of the

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first muffler, however it can be seen that outlet pipe (11) has a considerably longer length than outlet pipe (13) it would have been obvious to one of ordinary skill in the art to select a length of approximately twice as long, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With respect to claim 3 '446 discloses the invention as claimed except wherein the outlet pipe of the second muffler has an at least slightly larger diameter than the outlet pipe of the first muffler, one of ordinary skill in the art would have provided a larger diameter outlet in order to reduce the back pressure associated with the longer length of travel in the second muffler.

With respect to claim 12 Worner further discloses a muffler system wherein the cross over point does not provide significant gas exchange between the exhaust trains (when valves 12 and 13 are both in the open position).

With respect to claim 13 Worner further discloses wherein the at most one cross-over position comprises a common middle muffler (8, see column 3 lines 50-55, element 8 described as a third muffler). Cathcart discloses a minimal cross over. It would be obvious to apply the teachings of a minimal cross-over portion to cancel low frequency sounds with the common muffler of Worner. The motivation for doing so would be to only reduce the low frequency sounds, without a detrimental effect to the sporty sound of the exhaust.

With respect to claim 15 Worner is concerned with V type engines, which not expressly showing a V8, the teachings are applicable. While not expressly teachings

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wherein the ratio of the lengths of the outlet pipes maintain audible perception of oscillations of odd orders of a V8 engine, it would have been obvious to one of ordinary skill in the art to tune the exhaust system to provide whatever audible characteristics were desired from the system. In re Aller, 105 USPQ 233.

2.Claims 4-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE19743446 in view of Worner (US6938729) and Cathcart (US6662900) in further view of EP0682172 (hereinafter '172).

With respect to claim 4 '446 discloses the invention as claimed except wherein the first muffler has an interior structure divided into three part spaces by means of two metal separating sheets, with the first metal separating sheet being perforated and the second metal separating sheet being intact.

'172 discloses a muffler (see figure 5) wherein the muffler has an inner structure divided into three part spaces (9,10 and 11 in figure 5) by means of two metal separating sheets (8a and 8b in figure 5) with the first separating sheet being perforated (see figure 4) and the second metal separating sheet being intact (refer to claim 6 discloses wherein at least one of the sheets is perforate, implicitly disclosing wherein one is not).

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of '172 to have a muffler so structured with the mufflers of DE '446 to provide an exhaust silencer of improved sound reduction.

With respect to claim 5 '172 further discloses wherein the input pipe opens into the first space at the inlet side (refer to figure 5, openings in inlet pipe are present in the first space 9).

With respect to claim 6 '172 further discloses wherein the outlet pipe (7 in figure 5) leads starting from the first part space (9) on the inlet side through the second part space (10) and the third part space (11) with the outlet pipe (7 in figure 5) being able to be acted on by the flow both from the first part space (open to space 9) and from the first part space through the second part space (refer to openings 13).

With respect to claim 8 '172 discloses wherein a muffler has an inner structure divided into three spaces (9-11 in figure 5) by means of two metal separating sheets (8a and 8b) with the first separating sheet being intact and the second metal separating sheet being perforated (as '172 discloses that at least one of the plates is to be perforated it would have been obvious to one of ordinary skill in the art to apply this teaching with either plate 8a, plate 8b or to both plates 8a and 8b, perforate sheet taught by figure 4, perforations 17).

With respect to claim 9 '172 further discloses wherein the inlet pipe extends through the first space and through the second space at the inlet side and opens into the third space (as seen in figure 5 the pipe 6 opens into space 11 as well as space 10).

3. Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19743446 in view of Worner (US6938729), Cathcart (US6662900), EP0682172 and further in view of Uegane (US20010018995).

With respect to claim 7 '446 as modified discloses the invention as claimed except further comprising a resonator extending through the second part space and into the third part space adjoining the inlet pipe.

Uegane disclose a resonator (elements 34 and 32 in figure 2) which extend into a second and third part space (29 and 30 in figure 2) and adjoin the inlet pipe (14 in figure 2).

With respect to claim 11 Uegane further discloses a resonator (35 in figure 2) which connects the third part space (29) to the first part space (31 in figure 2).

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Uegane to provide a resonator connecting the part spaces of the muffler of '446 as modified to further reduce unwanted noise in a minimum of volume.

With respect to claim 14 the resonator as taught by Uegane (elements 34 and 32) which extend into second and third spaces, extend from an exit of the first inlet pipe, in as much as the resonators are the openings, and therefore exist of the first inlet pipe.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19743446 in view of Worner (US6938729), Cathcart (US6662900), EP0682172 and further in view of Nilsson et al (US20010045322).

With respect to claim 10 '446 as modified discloses the invention as claimed except wherein the outlet pipe leads through the second part space into the first part space on the inlet side, starting from the third part space and back through the second part space and the third part space in an arcuate curve with the outlet pipe being able to

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be acted on by flow at the inlet side both from the third part space and from the third part space through the second part space.

Nilsson discloses an outlet pipe of a muffler (7 in figure 1) leads through a second part space into a first part space on the inlet side, starting from a third part space and back through the second part space and the third part space in an arcuate curve with the outlet pipe being able to be acted on by flow at the inlet side both from the third part space and from the third part space through the second part space (refer to figure 1, partitions shown but unnumbered in figure 1).

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Nilsson to route the exhaust outlet pipe through the part spaces as claimed with the muffler of '446 as modified to provide a muffler in which "predetermined requirements for comfort directed low-frequency suppression of the exhaust flow noise as well as statutory requirements for high frequency absorption of the noise are fulfilled" (see abstract).

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19743446 in view of Worner (US6938729), Cathcart (US6662900), EP0682172 and further in view of Marx (US2573474).

With respect to claim 16 '446 as modified discloses the invention as claimed except wherein the common middle muffler includes an internal separation between the exhaust trains to prevent gas exchange between the exhaust trains.

Marx discloses a muffler having multiple inlets and outlets (see figure 1) having a central partition (29) to prevent exchange of gas between the exhaust trains. Marx also

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discloses a small exchange of gas between longitudinally adjacent chambers separated by transverse partitions.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Marx to provide a longitudinally divided muffler shell, and also the slight exchange of gases between separated chambers within a muffler, to serve as a means for only minimal exhaust exchange between exhaust chambers, to take place in the common central muffler as taught by Worner.

The motivation for doing so would be to provide only limited exchange, which taught by Cathcart reduces low frequency pulses, between the exhaust trains in an enclosed environment.

Response to Arguments

Applicant's arguments with respect to claims 1-11, and 13-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FORREST M. PHILLIPS whose telephone number is (571)272-9020. The examiner can normally be reached on Monday through Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on 57127221990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Forrest M Phillips/
Examiner, Art Unit 2832